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STAURONEIS TERRYI D. B. Ward.

BY T. CHALKLEY PALMER.

The anomalous diatom here to be dealt with was first made known by Mr. William A. Terry, of Bristol, Conn., the veteran collector and student of the Diatomaceæ whose enterprise has brought to light so many new forms. He collected it on Fall Mountain, Conn., in 1890, and during the same year Dr. D. B. Ward made a number of arranged mounts of the valves. These were distributed, together with photographs showing two of the curious upper valves side by side, under the name *Stauroneis terryana* Ward. This name was almost immediately and very properly amended by Dr. Ward, at the suggestion of Prof. Hamilton L. Smith, to *Stauroneis terryi*. One of Dr. Ward's slides, and a vial of the Fall Mountain material containing the diatom, were sent by Mr. Terry, in 1892, to J. A. Tempère, who in turn forwarded a specimen to Prof. P. T. Cleve. The first literary result was the noting of a new variety in Cleve's monograph.[1]

Stauroneis acuta W. Smith. Var. **terryana**, Tempère.

The description is exceedingly short, being confined to a measurement of the length and breadth, and a counting of the striæ, the statement ending, curiously enough, "Brackish water: Connecticut!"

The second result was a figure in Schmidt's *Atlas*[2] with the legend "1. Connecticut? (Original expl. Tempère), *Stauroneis acuta* W. Smith, var. *Terryana*, Tempère."

Now the sparse characterization in Cleve's monograph would seem to point anywhere except toward a recognition of the essential characters of Mr. Terry's diatom, and the impression of an existing misconception is amply confirmed by the figure in Schmidt's *Atlas*. Whatever may finally be determined concerning the relationship between this diatom and *Stauroneis acuta*, a reduction to varietal rank must base itself on something more to the purpose than a one-line description and a single figure of some form other than that which was named *Stauroneis terryi* by Dr. Ward.

The only other publication relating to this diatom which is known to me is Mr. Terry's own account[3] of its discovery on Fall Mountain with some reference to the very odd features of the upper valve.

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[1] *Synopsis of the Naviculoid Diatoms*, P. T. Cleve, 1894.

[2] A. Schmidt, *Atlas der Diatomaceen-Kunde*, Tafel 242, fig. 1, September, 1903.

During July of 1909 I received from Mr. Terry sundry vials of diatoms collected on Fall Mountain in 1891, with a request for the preparation of a number of arranged mounts, each of which was to show the upper valve, the lower valve and the complete frustule of *Stauroneis terryi.* Some of this material was labelled "fossil" and some "recent." It consisted very largely of *Stauroneis acuta,* together with its varieties, among which one might easily imagine "var. *terryana,* Tempère." But the diatom so tardy in the matter of obtaining recognition, though present merely in traces, was in such marked contrast with all these that no special difficulty was experienced in culling it from its multitudinous associates. During the preparation of the slides a certain curious or even unprecedented feature was noticed in many of the intact frustules—a feature neither shown by Dr. Ward's preparations and photographs, nor mentioned in any previous reference to this diatom. This was brought to Mr. Terry's attention, and at his request I have had proper illustrations made of the whole form, and present the following description of the diatom.

Stauroneis terryi D. B. Ward (ined.).

Frustule fusiform, slightly arcuate in girdle view, the upper valve more convex than the lower. Valves dissimilar, the upper partly enclosing the lower. No girdle bands, the valves held in place by a broad external silicious ring at the middle part. Ring slightly cemented to the valves, easily detached, about one-eighth the length of the frustule, very thin, surface obscurely punctate. Upper valve 370–400 μ long, 55–60 μ broad. Strongly convex transversely, swollen at the middle, diminishing with concave outlines to long, bluntly rounded apices, and bearing a large oval depression toward each end wherein the raphe terminates in a fine waved line; axial hyaline area rectilinear, expanding spatulately around subterminal depressions. Lower valve slightly smaller in all dimensions, without subterminal depressions, apices more slender, with lumen formed by a conspicuous thickening of the inner terminal margin; raphe continued approximately to end of valve; hyaline area rectilinear to the lumen, then narrowing almost to a point. Stauros on both valves widening outward. Striæ 12 in 10 μ, nearly normal to periphery throughout, punctæ becoming coarser and striæ more sparse around ends of upper valve.

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[3] W. A. Terry, *A Partial List of Connecticut Diatoms, Rhodora,* August, 1907, p. 126.

Fresh water. Fossil and recent.

Fall Mountain, Conn. W. A. Terry, 1890.

This diatom presents several curious features. It is the largest by far of the genus *Stauroneis*. It is the only one of the genus to show subterminal depressions on the valves. It is the only naviculoid diatom known to me that has a silicious belt about its middle part. For these and other reasons, it is of the greatest interest. The anomalous features specified might easily lead to the suspicion that we have here a monstrous form, a "sport," an abnormal condition of the species with which it is associated, *Stauroneis acuta* W. Smith. This idea might seem to find some confirmation in the fact that the striation and punctation, and the shape of the lower valve are approximately those of that species.

But monstrous forms do not, usually if ever, continue to produce themselves indefinitely, so that one shall find them in both the mud beneath and the water above. Monstrosities do not, like this form, recur not only for years and years in one place, but also in other ponds and streams of the same region.[4] Monstrosities are not, like this diatom, fairly uniform in characters, so that one picks out hundreds of quite similar specimens from the material. Whatever may be the relationship, Mr. Terry's diatom is something more than a teratological condition of *St. acuta.*

Some possibilities suggest themselves. Unquestionably the relationship is close. The peculiar silicious thickening at the ends of the lower valve is precisely alike in both, and this is a very significant fact. The striation and the beading are essentially similar. The lower valve, apart from its size, might upon superficial study be thought identical with the valves of *St. acuta.* The outline of this diatom, however, is different, even in the lower valve. Also, the walls of both valves are thinner, and the whole frustule is more nearly circular in cross-section. The size is relatively colossal, being more than twice as long as the ordinary *St. acuta*, There are no girdle-bands in any of the hundreds of frustules examined or mounted, nor were any bands found in the accompanying material that could possibly belong to this form. No instance of reduplication has been observed, and as a consequence, the ultimate fate of the unique silicious ring or belt is not known, though one must think its rupture a condition precedent to this process.

Some of these features might seem to point toward the conclusion that we have here a sporangial condition. This view would carry with it an explanation of the comparative rarity of the diatom in the gatherings of Mr. Terry. But on such an hypothesis, one would expect to find, in this rich material, some indication of the process of return to normal form. Nothing of this sort has yet been seen. However, negative evidence answers no questions. Plainly enough, a study of the life-cycle of this diatom is a desideratum. Not only might such a study clear up the question of relationships within the genus,—in Mr. Terry's form we have extra-generic characters, and they may easily prove to be of great significance in solving the problem of the genetic connections of *Stauroneis*,—but such a study will necessarily be carried on with living material.

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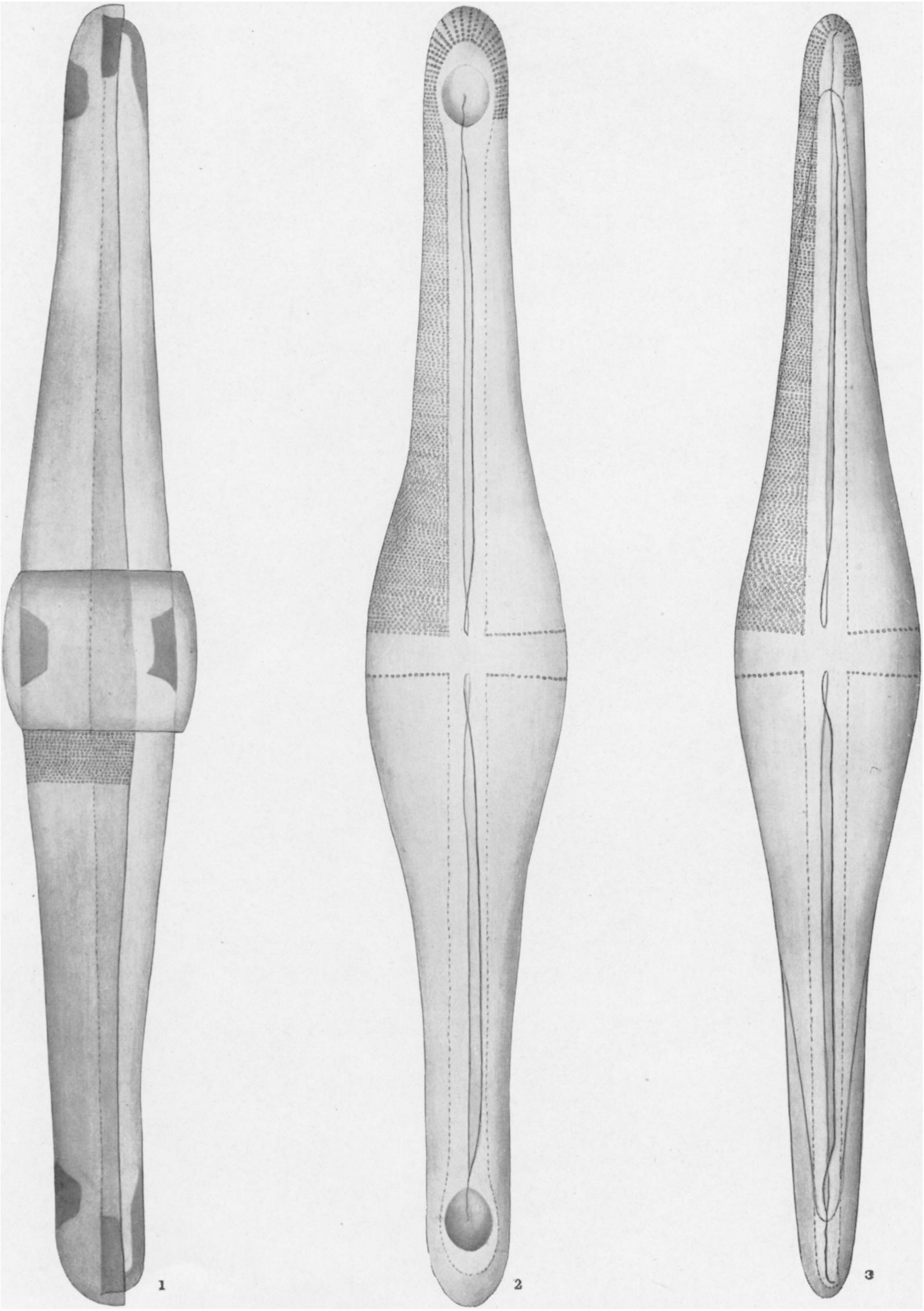
[4] Mr. Terry finds it in "three widely separated ponds in Bristol." *Rhodora*, August, 1907.

EXPLANATION OF PLATE XXXIV.

Stauroneis Terryi, D. B. Ward.
Fig. 1—Complete frustule, girdle view, showing external ring.
Fig. 2—Upper valve with subterminal depressions.
Fig. 3—Lower valve.

Amplification, 500 diameters.



PALMER: STAURONEIS.